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Abstract

The handbook is designed to assist teachers to obtain an clear picture of many kinds of activities and programs used in a resident program for environmental education. Information and guidelines are included on such items as: (1) role of the teacher who brings a class to a resident program; (2) preparation and planning programs; (3) use of the outdoors as a learning environment; (4) skills and knowledges in environmental sciences and related topics in environmental education; (5) evaluation of environmental education; and (6) role of the staff of the Conservation and Environmental Science Center (CESC) in providing services for each participating school. Related documents are RC 003 788, RC 003 789, RC 003 790, and RC 003 791. (SW)

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CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Teachers Workshop Handbook for Resident Programs

[1968]

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RC003792

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
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Foreword

For more than a decade, specifically since "Sputnik" in 1957, outer space and the environments of the Moon, Venus and Mars have captured the interests of the American public. It may be said that this initial Russian thrust into space set off a chain of events that has changed the course of science, education and many other relevant aspects of American society.

If the environment of worlds beyond the earth's limits has potential for meaning then the environment immediately outside the classroom should be even more significant. It may be a truism that today's children know more about outer space than their immediate surroundings.

In this era of space exploration, school curriculums are expanding rapidly and the changes in how, what, and why children "need to know" reflect a new sophistication and concern for the world we live in. Environmental education is in the vanguard of curricular concerns about our environment.

In environmental education the resident program has two outstanding advantages. The first of these is that social relationships among students and between students and teacher are re-examined, intensified and usually improved. This is the common denominator for all resident programs despite their wide variety in program interests.

Any teacher who has the opportunity to share a resident program in environmental education with his class will bask in the warmth of the social insights which will accrue to him and the class.

The second advantage is the opportunities for intensified study afforded by large time blocks. Environmental education on a dawn to bedtime schedule triples the length of the school day. In this situation activities and events may be interpreted, discussed or supplemented immediately after they occur. Only by participation in such a resident program can an inexperienced person begin to perceive its intensified potential.

The objectives of the resident program in environmental education primarily include the intent to capitalize on the inherent advantages just described. Of course the objectives for all environmental education are vigorously sought.

Environmental education anywhere seeks to create a concern for all environments that leads to a commitment to preserve optimum environments and improve less desirable environments. The resident environmental education program affords this opportunity for one or more environments.

In addition, environmental education concerns itself with the learning environment. What environmental education seeks is a commitment by educators to develop and utilize situations and conditions where learning can flourish.

This handbook is designed to assist teachers to obtain a clear picture of many kinds of activities and programs used in a resident program for environmental education.

This handbook will provide information and guidelines about such significant items as:

1. Role of the teacher who brings a class to a resident program.
2. Preparation and planning of programs.
3. Use of the outdoors as a learning environment.
4. Skills and knowledges in environmental sciences and related topics in environmental education.
5. Evaluation of environmental education.
6. Role of the staff of the CESC in providing services for each participating school.

It is expected that each of the members of a school district delegation will select the widest range of offerings on the program so that maximum coverage is achieved.

ORGANIZATION

EVALUATION

CURRICULUM PLANNING

for

RESIDENT PROGRAMS

in

ENVIRONMENTAL EDUCATION

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Extending The Classroom Walls Through

A Resident Environmental Education Program

Environmental education begins in the classroom. When presenting areas within the curriculum, emphasis is placed on development of skills as well as subject matter. This is done at all grade levels by inter-weaving skills and subject matter using various classroom approaches, followed by a "learning by doing" method during a resident environmental education program.

The better organized the environmental education is in the classroom, the better, more meaningful, and more lasting will be the learnings during a resident program. Duration of time and sequence, then, are very important. On the following pages a sequence is presented, as well as suggested curricular guidelines and points of emphasis.

(See section: The CESC Coordinator's Role)

The sequence which follows was tried successfully with a sixth grade class for three years. A unit on Conservation set the stage. The first unit was followed by a study of Ecology (which can be readily correlated with Conservation studies). The ecological study was sub-divided into zoology which included ornithology, typical animals of woodlands and swamps and botany. In each science area the basic aims were the skills and attitudes gained by each member of the class. The depth of subject matter was dependent on the overall ability of each student in the class.

Geology was also studied not the all-too-usual presentation of the student's rock collection, but rather, with an emphasis on the role the earth itself plays in the balance of nature. Sufficient time was scheduled for the study of weather so that each student had a turn as the classroom's weatherman. If a similar sequence is followed the initial unit of study should commence approximately six weeks to two months before the class is to leave for the resident center.

A progressive sequence in the area of science should be a primary consideration when preparing the class for a resident environmental education program. A conservation unit which can be inter-woven with all the succeeding scientific areas should be considered. An even more desirable approach would be to use an inter-disciplinary framework which would then involve more areas of the total curriculum.

nesting habits and materials, bird activity in relationship to light intensity, strata location in the nesting and feeding areas of the forests could all be studied to demonstrate the role birds play in the balance of nature.

Mammals, when studied, should be presented in their ecological setting. Herbivorous and carnivorous feeding habits, types of shelters, and types of defense, including protective coloration, may be used to demonstrate the position of mammals in the web of life.

(See sections: Animals in The Pines and CESC Bird Study Guide Sheets)

Insects, as the most numerous members of the animal world, should be observed and investigated. The relationship of insects to plants and other animals in the wild, and plants and animals bred by man should be studied. The symbiotic relationships in which some insects exist should be pointed out to the class. Microscopic animals should be studied to demonstrate the role they play and to point out the many different phyla which compose the animal kingdom. The role all animals play in relationship with the plant kingdom should be stressed; their part in soil making, seed carrying, and the like.

In the area of Botany, the four great plant groups should be presented with a brief study of the basic characteristics used for classification. This study is easily brought alive in the out-of-doors, where the ecology of an area has the potential for a meaningful contribution to the learning experience.

The major types of ecological plant succession should be stressed and studied, such as: dry succession-xerarch and wet succession-hydrarch. By previous discussion in the classroom of the different types of plant communities, "why they grow", "where they grow", "when they grow", and the order in which they may be predicted to grow in certain areas, plant ecology may be brought vividly alive in an outdoor setting.

The study of ecological succession within plants creates a natural situation for developing identification skills. Children should be able to identify the more common plants of their area.

To develop a working background the classroom teacher is directed to read The Study of Plant Communities by Henry J. Oosting, Ph. D., a leading authority in the field of ecology.

(See section: Pinelands Soils and Outdoor Observation Experiences)

Geology: Geology is almost always a desirable part of the resident program. Soil determines the type of plant life and then, in turn, the type of animal life an area is able to support. Too many times, geology at the elementary level begins and ends with a discussion of different types of rocks culminated by various students

displaying their rock collections. This is good, but not if it is an end in itself.

The geology study could begin with an investigation of topography, landforms and incidental rock collections. The rock classifications, igneous, sedimentary and metamorphic, including how rocks are divided into these classifications may be presented next. A study of the natural forces which brought these class types into being might then follow.

Classification of different types of soils may also be considered. The basic types of soils found in the local school area might be investigated along with the respective types of flora and fauna of each soil type. A study of a soil profile is necessary to demonstrate graphically how soil is formed. Use of charts in the classroom followed by actual soil cross-views in the field would make these learnings meaningful.

Water movement through different types of soil should be shown to demonstrate how different types of soil determine the amount of water available to support plant and animal life.

The study of soils within a geology unit will tie-in effectively the relationship of soil to the types of life it supports. This is influenced by the amount of organic and inorganic materials contained in the humus layer coupled with the availability of soil water.

(See sections: Geology and Pineland Soils)

Weather: Prior to the sixth grade level, many general elementary weather concepts should have been developed. It is wise to initiate this unit with a review of the basic weather factors: temperature, humidity, air pressure, and winds. This review will determine where to begin a new weather unit with the class. The basic objective of the unit should be to develop a practical understanding of weather causes, by learning in a practical situation how weather instruments are used to determine present atmospheric conditions for the purpose of predicting possible changes in the weather.

Simultaneously, the class groups might be directed to build weather stations, which will include the basic measuring instruments. Thus, each group would gain an understanding of how the weatherman uses these instruments to gather information for future weather prediction.

The basic instruments which may be built by the class are: the wind vane, the barometer, the rain gauge, the hydrometer, and the anamometer. Directions for constructing such instruments can be obtained by purchasing the Instructor Science Activities Weather Kit published by the F.A. Owens Publishing Company. In a residency program, enough instruments should be constructed to service one weather station for every two cabin groups. Enough time should be allowed for building the

instruments and studying the weather factors they measure. Each student should have a school day to play class weatherman. While the study is progressing, it should include evaluation of commercial weather maps and viewing of weather telecasts so that all facets of this study may be tied together.

In terms of group responsibility, the groups who will share a station at the resident center should work together building the instruments. Also, as group members are developing an understanding and use of the instruments, they should be reminded that their predictions will be used to determine the type of clothing, (foul or fair weather), which each member of the group will wear for the next phases of the day's activities.

Approximately six weeks to two months should be allowed for the weather unit. The time required for daily weather study and prediction could be scheduled after formal instruction.

Astronomy: Astronomy is generally included within a study of the universe. Astronomy offers an excellent theme for an evening's activity in a resident program. Obviously, there is not enough time in one evening at a star party to develop the background sufficient to understand all the astronomy that may be presented in such an ideal situation. Within the classroom much can be developed. Vocabulary should be presented. Skills in finding the North Star and identifying some of the major constellations should be developed. Much of the classroom preparation might hinge on suggestions provided by the resource person chosen to conduct the activities at the resident center.

Classroom activities in astronomy may be supplemented by the purchase of the Instructor Science Activities Astronomy Kit published by the F.A. Owens Publishing Company. The kit includes sufficient direction sheets for a class of 35 and includes a teacher direction sheet. Included in the direction sheets are specific instructions for constructing homemade reflector and refractor telescopes. These might be built by those interested and then used during the resident program's astronomy activity.

Mathematics: In the out-of-doors, mathematics may be taught in terms of orienteering or compass uses. Compass activities, in the field, may deal with following compass courses. Proper use of a compass should be taught before any group is taken into the woods.

(See section: Mathematics in the Out-Of-Doors, the CESC Environmental Instruction Plans: "North, South, East & West," and "How to Measure Inaccessible Areas.")

Physical Education: In a resident environmental education program, school children are extremely active for many more hours than in their regular classroom situation. The program as suggested by President Kennedy's Council on Physical Fitness is a good one to follow to condition the class for the increased activity at the CESC. (See section: Recreation in the Out-Of-Doors)

Social Living: A two-fold approach is used in the area of social living during a resident program. For the class, the aim is development of social responsibility. Behind the scenes, the teacher should divide the class into heterogeneous cabin groups representative of the total class. In developing social responsibility designated cabin groups should, wherever possible, represent a microcosm of American society.

It has been shown that of all the learnings available in resident environmental education programs, those of social value are the greatest and offer longest retention for all participants. Hence, any grouping decided upon must be a decision reached after considerable deliberation.

Once optimum groups have been organized, a wide variety of group activities and learning experiences should be planned for and carried on within the classroom. It is advisable that these groups be organized well in advance of the resident environmental education experience at the CESC.

The groups should be trained to function constantly in all areas of the classroom program. Responsibilities within the group should be shared and rotated. In this way, both leadership and an ability to follow will be developed, in varying degrees, for each child involved. All of this pre-residency class preparation will insure the children a minimum of difficulty when sharing a 24-hour living experience in contrast to the nine to three school day.

We have not touched on art, music, social studies and the humanities. Each of these curricular areas is readily adaptable to an outdoor setting. Sections in this handbook deal with each of these topics except music.

(See sections: Agriculture in the Pine Barrens - Whitesbog; Art with Native Materials and Exploring an Historical Site)

Evaluation for environmental education is especially significant because of its social mission. The development of behaviorally stated objectives is a significant step toward developing an effective evaluative procedure.

(See section: Evaluation)

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Extending the Classroom to a Resident Outdoor Setting

OBJECTIVES:

1. Participants will demonstrate knowledge of day to day opportunities for strengthening the residency program for their class at CESC.

2. Participants will demonstrate skills in planning activities that connect classroom programs with residency programs so that they become a coordinated series.

OUTLINE:

1. Objectives for resident programs in environmental education.

2. Environmental components for existing curricula.

3. Interdisciplinary approach to environmental education.

4. Pupil planning and participation.

PROCEDURE:

1. Discussion of handbook material.

2. Planning and procedure

    a. Review of curriculums used in schools of participants to relate discussion to particular classrooms.

    b. General planning of specific pre-trip activities.

3. Conclusion

    a. Exchange of ideas developed in "2-b" above.

EVALUATION AND DISCUSSION:

1. Elicit response from participants concerning their reactions to the preceding lesson(s).

2. In order to prepare participants to carry out classroom lessons on this topic, have participants discuss preparation, organization and procedures, such as:

   a. objectives
   b. organization
   c. supervision
   d. lesson plans
   e. evaluation

3. Estimate or determine which of the stated behavioral objectives can now be demonstrated by the members of the group.

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Evaluation in Environmental Education

OBJECTIVES:

Participants will be able to:

1. Write behavioral objectives.
2. Plan evaluative procedures for measuring some gain toward objectives stated in behavioral terms.
3. Develop a plan for evaluating one or more aspects of the of the program planned for their districts.

OUTLINE:

1. Behaviorally stated objectives.
2. Evaluation instrument for environmental education.

EVALUATION AND DISCUSSION:

1. Elicit response from participants concerning their reactions to the preceding lesson(s).
2. Encourage participants to share and exchange knowledges of reference and resource material related to this topic.
3. Estimate or determine which of the stated behavioral objectives can now be demonstrated by the members of the group.

PROCEDURE:

1. Discussion of what behavioral objectives are.
2. Study of "Environmental Education" evaluative handbook.
3. Participants divided into small groups.
    a. Practice sessions in writing behavioral objectives.
    b. Development of evaluative procedures for participants' particular purposes.

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Mager, R.F., Preparing Instructional Objectives, Fearon Publishers, 1962

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Objectives in Environmental Education Lessons

1. An instructional objective describes an intended outcome rather than a description or summary of lesson content.

2. Objectives should be measurable either immediately or on a long term basis.

3. One characteristic of a usefully stated objective is that it is stated in behavioral or performance terms that describe what the learner will be doing when demonstrating his achievement of the objective.

4. The objective that is most usefully stated is one that best communicates the instructional intent of the person selecting the objective.

5. An objective is meaningful to the extent that it communicates an instructional intent to its reader and does so to the degree that it describes or defines the terminal behavior expected of the learner.

6. Terminal behavior is defined by:
   a. Identifying and naming the observable act that will be accepted as evidence that the learner has achieved the objective.
   b. Describing the conditions (givens, restrictions) necessary to exclude acts that will not be accepted as evidence that the learner has achieved the objective.

7. Some sample behaviorally stated objectives:
   a. Students will be able to give a verbal account of the area around the school grounds.
   b. Students can demonstrate skill in determining rate of water flow in a stream.
   c. Students should be able to write descriptive paragraphs using sensory words.
   d. Students can determine the age of trees by the increment boring technique.

8. If you give each learner a copy of your objectives, you may not have to do much else.

From: Mager, Robert F., Preparing Instructional Objectives, Fearon Publishers, 2165 Park Boulevard, Palo Alto, California
Copyright 1962. Price $1.75

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Coordinators' Role

OBJECTIVES:

1. Participants are aware of the capabilities and duties of the CESC Consultants and can plan for the use of such personnel in developing school programs.

2. Participants are familiar with press releases, notifications to parents and perform other duties requiring skill in public relations techniques.

3. Participants are conversant with specific problems involving staff and administration, and other problems that may arise in developing an environmental education program.

4. Participants can instruct their students in the following techniques:

   a. dining hall procedures
   b. dormitory clean-up
   c. small group procedures
   d. bulletin board displays
   e. medical emergencies
   f. no littering

OUTLINE:

1. General description of the CESC Consultants, and their role in assisting the coordinator and teachers from each district.

   a. teacher workshops
   b. class demonstrations
   c. dissemination of materials
   d. lesson preparations
   e. parents' meetings
   f. PTA demonstrations
   g. public relations

2. Specific skills required of a district coordinator:

   a. communications -- responsibility to inform all concerned individuals
   b. bulletin boards and displays
   c. preparation of press releases
   d. selection of an "administrative director"
   e. conducting parents' meetings and preparing parent notifications

3. District coordinator's techniques and knowledges needed in communicating with:
   a. administration
   b. students
   c. parents
   d. other faculty members

Coordinator's Role - cont'd

4. Information needed by District Coordinators in residence:

   a. dining room procedures
   b. use of library and equipment
   c. what to do in case of an emergency
   d. parental visitation
   e. telephone calls
   f. soda vending machine

ACTIVITIES:

1. Each participant will discuss the role of the CESC Consultant and write out, for the instructor, at least 3 ways they can use a CESC Consultant in their school program.

2. Each participant will complete one "pre-residency" press release and discuss ways of developing residency and post-residency press releases.

3. Each participant will select an administrator in his school district whom they feel would be a competent administrative director for his district's program.

4. Each participant will "role play" hypothetical situations, to help gain experience in such interactions, between the district coordinator and: an administrator, a fellow teacher, a parent, and a student.

5. Participants will visit and familiarize themselves with the CESC library, equipment room and dining hall.

CONCLUSION:

Final discussion and evaluation.

RESOURCES:

1. CESC Handbook
2. Sample press releases
3. Sample residency schedules
4. Sample lesson plans
5. Simulated interaction Training Situation Cards

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
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Disseminating Information
About Environmental Education Programs

What happens in the classrooms is becoming of increasing interest to the public in general and to educators in particular. The Conservation and Environmental Science Center for Southern New Jersey, servicing a consortium of more than 55 school districts in eight counties, is concerned with environmental education. CESC through its dissemination consultant and professional staff is active in publicizing its program and curriculum materials.

One of the problems in describing environmental education is that this curricular effort suffers from a number of names which conjure up stereotypic notions in the minds of our audiences.

For example: we avoid words like "camp" or "encampment" because our environmental education program would then be equated with a summer camp and the varying degrees of "roughing it at camp." CESC's Resident Environmental Education Programs, scheduled for five days from mid-September to early June of the school year, are not intended to seek the objectives gained by a camping program. However, CESC will operate one or more camping programs this summer with emphasis on outdoor living, survival skills and group dynamics. Such programs are seldom profitable in terms of educational value, or feasible for children in the five-day module.

We seldom call the CESC program "outdoor education" because that term often does not imply a concern for environments, their nurture or preservation. Similarly, outdoor education is often mistaken for a recreation program with little other curricular concern.

Environmental education does include the methods of using the outdoors as a prime source of direct first-hand experiences in the curriculum. Since environmental education utilizes a multi-disciplinary approach, CESC hopes to avoid news releases which categorize the Resident Environmental Education Program as an "outdoor science program" or a "nature program." For this reason we also avoid the terms "nature center" and "science camp." CESC's resident programs contain such aspects, but also much more.

Two sample news releases are attached. They illustrate minimal reporting of essentials desired by most news editors. You may wish to schedule a session with CESC's dissemination consultant to discuss various audience levels for dissemination and other pertinent techniques.

SUGGESTIONS ON NEWS RELEASES

Attached to this sheet for your use is a suggested news release about you and your class. Please type in the proper names and class description. Since there are some general rules for a news release, it is hoped the following format and style suggestions for newspaper releases are helpful to you.

1. Indicate IMMEDIATE RELEASE at top of first page.
2. Begin first page about half-way down on the paper.
3. Double space each page.
4. Please indicate --MORE-- and use 1st add, 2nd add, etc.
5. At end of release sign off with #### or -30-.
6. Either at the top of the first page or at end of the release type your name, either home or school address and phone number.
7. Do not headline your news release.
8. Do not mail smudgy carbon or ditto copy to a newspaper editor. The extra time allowed for clean copy may guarantee editorial acceptance of your release and spark a feature story interest.

About pictures: Perhaps a call from you, or someone in the school, to the editor of the newspaper might insure publication of a picture with the release, (if one is available), or as a follow-up to your first release.

Most newspaper editors prefer as few persons as possible in a picture, (preferably no more than four, who can be easily identified). It might be preferable to arrange for publication of more than one photo, if a larger number of persons will be photographed. Weekly newspapers are more apt to publish a group photograph.

Please call on us at the Conservation and Environmental Science Center (893-9154) if you need special help with news releases.

FOR IMMEDIATE RELEASE

The _____ School District will have a
(name of school district)
_____ and _____ class(es) attending the Conservation and Environmental Science Center for Southern New Jersey.

_____, the _____ grade teacher is
(Miss, Mr., Mrs. - teacher's name)
accompanying _____ class to the CESC. _____.
his, her *CESC consultant's name*
CESC staff member and school consultant, has been involved in planning and organizing the program of study and experience for _____'s
(teacher's name again)
class, for the past few weeks.

The Conservation and Environmental Science Center, a Title III project is funded by a grant from the U.S. Office of Education under the Elementary and Secondary Education Act of 1965, is temporarily leasing facilities at the Mt. Misery Methodist Conference Center, near Browns Mills.

-- MORE --

1st add/Class

The children will live at the environmental education center from Monday until Friday afternoon, the week of _____. Separate
(dates)
boys and girls dormitories, a community dining hall, an infirmary and classrooms are available at the Center. The CESC staff and personnel from _____ School District will supervise the week-long activities in community living and learning. (List names of additional personnel) will be participating in the program at the Center.

The ____ grade class will participate in a week of study and training in environmental science and conservation. The program will involve small group exploration into air and water pollution and other areas of ecology, astronomy, geology, the historical and present-day implications of the Pine Barrens, and other aspects of their unique out-of-doors school.

The Conservation and Environmental Science Center program emphasizes that the usual school subjects, such as English, mathematics, art and music, will be experienced in real life situations in the out-of-doors. For example, a practical application of mathematics will be measuring the height and diameter of a tree to determine the amount of board feet and the tree's economic value. Language art skills will be developed through written and oral reports, creative writing and story telling activities.

Upon the return of the _____ grade class from the environmental education Center, _____ and _____
(teacher's name) *(CESC consultant's name)*
will follow up the resident activities with a classroom and on-school grounds program. Included in the post-resident program will be reports of the class members' experiences and studies at the outdoor Center. A compiled class report will be submitted to the school board at a future date to be announced.

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FOR IMMEDIATE RELEASE

The unique experience of learning and living together at the Conservation and Environmental Science Center for Southern New Jersey will be shared by pupils and teachers in _____'s _____ (and) _____ grade class(es).
school district or community name

"Planning and preparation for the week-long experience from Monday morning until Friday afternoon, has been underway for several weeks now," said _____, the _____ grade teacher.
(Mr., Miss, Mrs.) teacher's name

"The children will be at the Conservation and Environmental Science Center during the week of _____," said _____.
dates other teacher's name

who is also accompanying _____class.
his, her

_____, a CESC staff member, has been consulting
School Consultant's name

with _____ and _____, helping to organize the program of study and experience for each class while at the environmental education center.
teacher's last name only other teacher's last name

--MORE--

1st add/class

The Conservation and Environmental Science Center, a Title III project, is funded by a grant from the U.S. Office of Education under the Elementary and Secondary Education Act of 1965, temporarily leasing the facilities of the Methodist Conference Center, at Mt. Misery near Browns Mills.

Boys and girls will live in separate dormitories and share their meals in a community dining hall. An infirmary and informal classrooms are available at the Center which is located in New Jersey's Pine Barrens' area.

The CESC's staff and personnel from the _____ will
name of school district
supervise the week-long activities in community living and learning. (LIST NAMES OF ADDITIONAL SCHOOL DISTRICT PERSONNEL) will be at the CESC and involved in the program.

The school children will participate in a week of study and training in environmental science and conservation. The program will involve small group exploration into air and water pollution and other areas of ecology, astronomy, geology, the historical and present-day implications of the Pine Barrens, and other aspects of their unique out-of-doors school.

The Conservation and Environmental Science Center program emphasizes that the usual school subjects, such as English, mathematics, art and music will be experienced in real life situations in the out-of-doors. For example, a practical application of mathematics will be measuring the height and diameter of a tree to determine the amount of board feet and the tree's economic value. Language art skills will be developed through written and oral reports, creative writing and story telling activities at the Center.

Included in the post-resident program will be reports prepared by individual class members, of their experiences and studies at the outdoor Center. A compiled class report, including pupil evaluations of their week in the out-of-doors, will be submitted to the school board.

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CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
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After CESC - What Follows?

OBJECTIVES:

1. Participants can demonstrate knowledge of organizing and conducting environmental education activities within their districts.

2. Participants can demonstrate knowledge of how to develop an environmental education master plan for their district.

OUTLINE:

1. Environmental education in the total curriculum.

2. Sourcebook for environmental education for a school district, (Local Education Agency).

3. School site laboratories for environmental education.

4. Mobile laboratory-libraries for environmental education.

5. Master plan for environmental education in a school district.

PROCEDURE:

1. Discussion of:

   a. What is a master plan for environmental education?

   b. Developing a local district sourcebook for environmental education, K-12.

   c. Developing school sites for environmental education.

   d. Developing and using a local district Mobile Environmental Field Laboratory.

   e. Placing environmental education into the total curriculum.

   f. Developing extra-curricular activities such as clubs, etc.

2. Discussion triggered by questions:

   a. What is your first step after you return to your school district?

   b. Summary of ways and means to put together a local district sourcebook?

After CESC - What Follows?

c. Summary of ways and means to develop a school site for environmental education.

d. Group discussion following this question:

Will following through on the above three items expedite the process of placing environmental education into the total school curriculum?

e. What role can teachers play in the development of a public conscience about environmental problems?

EVALUATION AND DISCUSSION:

1. Elicit response from participants concerning their reactions to the preceding lessons(s).

2. Estimate or determine which of the stated behavioral objectives can now be demonstrated by the members of the group.

BIBLIOGRAPHY:

Environmental education materials provided by CESC.

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Hammerman, Donald R. and Hammerman, William M., Teaching in the Outdoors, Burgess Publishing Co., Minn., Minn. 1964.

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Teacher Assistant Program for High School Juniors and Seniors

CESC is a public, private and parochial school environmental education project, currently sponsored by the Federal Government, under Title III, E.S.E.A. One phase of this project involves elementary and junior high school students in a resident program. In such a program these youngsters reside at the CESC for a school week. During their stay they are involved in activities in many areas of their regular school day program. Though all areas of their regular studies are included, special emphasis is placed on environmental education. That is, they concentrate on the sciences and the social sciences. Because they will be living together 24 hours per day, for five days, the program emphasizes the advantages of a social living experience.

Teacher Assistants

What is asked of you: Your responsibilities include:

1. Assisting teachers in the field in small group instruction.
2. Guiding resident students in the dining hall, emphasizing procedures and proper table manners, as well as directing conversation.
3. Being responsible for the personal hygiene of the children placed under your direction.
4. Assuming leadership for the cabin group assigned to you:
   a. checking that the sleeping area is clean and neat at all times.
   b. that the children are on time for meals and activities.
   c. that the children are in bed with lights out at the designated time.
5. Assuming any other leadership role and/or duty as assigned to you by all CESC staff members.

Benefits to you:

A week at the CESC will give you a better understanding of the deep seated problems related to all of our environment.

Benefits to you - cont'd

If you plan to enter the teaching profession, serving as a teacher assistant will give you first hand experience working with children.

Leadership experience gained at CESC will help you grow as an individual and aid you in obtaining summer jobs during your years in college.

Upon successful completion of a teacher assistant experience during a residency, an appropriate letter of commendation will be entered in your folder in the high school guidance office. Such a letter is advantageous to have when applying to a college or for a job.

Problems you may encounter:

1. Handling the children...you are not asked to be a policeman. If you act like one, you will only create trouble and problems for yourself.

2. The possibility of a 16-hour work day...your job will not be easy. You will spend most of your hours with children.

3. There will be little time for your own studies. Get your make-up assignments well in advance, and don't put off completing them until the last minute.

Rules of the CESC:

1. When you have a problem, don't hesitate to ask any member of the staff or teachers for advice.

2. You are not permitted to leave the CESC on your own -- only in the company of an adult, and then only with permission of the person in charge.

Advance Requirements:

1. Complete the multiple permission form which must include all your teachers and your parents signatures.

2. Get all make-up class assignments in advance of your visit to CESC.

3. Complete the medical form and bring it with you. Turn it in to the CESC office upon arrival.

4. Make sure you get a copy of the suggested clothing list.

If, after reading all of the above carefully, you are still interested, obtain all the necessary permissions and are selected, the CESC welcomes you aboard. We hope the week will be an enlightening and rewarding one. If you have any questions after the orientation session, please feel free to call Mr. Ed Kiess, CESC Associate Director, at (609) 893-9152.

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Teacher Assistant Program - Multiple Permission Form

Name _____ Date _____

School _____ Home Room _____

Address _____ School Phone _____

_____ Home Phone _____

Teacher's Permission:

Period	Room	Subject	Teachers' Signature

Parent's Permission:

_____ has my permission to act as a Teacher Assistant at the Conservation and Environmental Science Center for Southern New Jersey during the week of _____ while children from _____ are in residence. I have read the material distributed to prospective high school students.

Date _____ Signed _____

CURRICULUM MATERIALS AND ACTIVITIES

for

RESIDENT PROGRAMS

in

ENVIRONMENTAL EDUCATION

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Agriculture in the Pine Barrens - Whitesbog

OBJECTIVES:

1. Participants should be able to give a verbal account of the history of land use in the Pine Barrens.

2. Participants should demonstrate a knowledge of the problems of agriculturalists in the Pine Barrens.

3. Participants should gain a working knowledge of two successful Pine Barrens agricultural industries--cranberry and blueberry crops.

4. Participants should be able to compare and contrast life in a "company town" and in non-residential agricultural enterprises.

OUTLINE:

1. Background - discussion

    a. History of area
    b. Present status
    c. Future plans - including CESC plans for Whitesbog '71

2. Whitesbog

    a. Agricultural problems (soil conditions, climatic conditions, etc.)
    b. Cranberry industry

        (1) water system
        (2) planting
        (3) harvesting

    c. Blueberry industry
    d. Company town - its function and role in workers' lives.
    (for benefit of teachers when bringing classes)
    e. Optional science studies

        (1) soil testing
        (2) bog studies

Agriculture in the Pine Barrens - Whitesbog - cont'd

3. Summary discussion

   a. Presentation of study questions and resource materials
   b. Familiarization with references for additional resource material available to teachers.
   c. Organization of school class

      (1) divide class into groups
      (2) preliminary preparation
      (3) activities at Whitesbog

MATERIALS:

1. Guide sheet for teachers
2. Soil test kit
3. Water, soil, air thermometer
4. Cranberry scoop

CONCLUSION:

Final discussion and evaluation.

BIBLIOGRAPHY:

Saturday Evening Post, Sept. 12, 1942, Blueberry Queen, Philip S. Rose

Cranberries; America's Native Fruit, Ocean Spray Cranberries, Inc.

The Pine Barrens, John McPhee (Articles from The New Yorker: Profiles)

Article on Isaiah Haines, Sept. 7, 1968, Trenton Times

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

WHITESBOG TEACHERS' STUDY GUIDE

A. Whitesbog Company Town

1. Who founded Whitesbog?
2. How old is the town?
3. What is a company town?
4. How many different buildings can you identify?
5. What role did each of these buildings play in the town?
6. How did the company workers buy food, clothing, etc.?
7. What did the company do for the people of the town?
8. What kinds of social activities did the people have?
9. Make a sketch of the village and label the buildings.

B. Migrant Worker Villages - Rome and Florence

1. What is a migrant worker?
2. How did these villages get their names?
3. Why did migrant workers come here?
4. What did the migrant workers do at Whitesbog?
5. How did they live?
6. How are the migrant workers' homes different than yours?
7. How old are their homes and the other buildings?
8. What is the national origin of the people who first lived here? What is the national origin of migrant workers who have lived here subsequently?
9. What is the present status of migrant labor at Whitesbog?

Cranberry and Blueberry Industries at Whitesbog

1. What is a cranberry bog?
2. What do cranberry plants look like?
3. Is a cranberry bog like a farm? Explain.
4. Is a source of running water essential to cranberry farming?
5. What kinds of work do cranberry farmers do?
6. When is a cranberry bog planted?
7. How deep is a cranberry bog?
8. When and how is a cranberry bog harvested?
9. What would happen to a cranberry bog is no one were to care for it?
10. What are the canals and sluice gates used for?
11. What other crop is grown at Whitesbog?
12. Who developed the large size blueberries at Whitesbog?
13. What do blueberry plants look like?
14. How were uncultivated blueberries brought to Whitesbog?
15. When and how are blueberries harvested?
16. Why do crops of cranberries and blueberries grow well in this area of New Jersey.
17. What weather factors affect both the blueberry and cranberry crops?
18. How does a blueberry or cranberry farmer protect his crops against predators?
19. Have machines replaced the migrant workers needed for the harvest in years past?

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Studying Animals in the Pine Barrens

OBJECTIVES:

1. Participants will demonstrate their ability to study animals using at least four of the methods outlined below.

2. Participants should be able to devise activities suitable for students to use in studying animals.

OUTLINE:

1. Ecology of animals in the Pine Barrens

2. Animals of the Pine Barrens:

fox	weasel	muskrats
mink	squirrel	skunk
raccoon	chipmunk	otter
woodchuck	deer	rats
oppossum	rabbit	snakes
beaver	mice	turtles
bog lemming	mole	birds
		shrew

3. Methods of observing and studying animals

   a. Sighting:
      1. baiting
      2. fur, feathers, skins
   b. Homes:
      1. nests
      2. dens
      3. burrows
      4. beds
   c. Sound:
      1. movements - locomotion, food gathering
      2. song
      3. call
   d. Tracks:
      1. take casts
      2. identification
      3. bait for tracks
      4. trails
   e. Odor:
      1. skunk
      2. rabbit
   f. Traps:
      1. live traps
      2. photo traps
   g. Droppings:
      1. identify animal
      2. identify food
      3. owl pellets

PROCEDURES:

1. Discussion
2. Demonstrations of observations and study methods
3. Participants divide into small groups and carry out one or more of the following tasks:

    a. Find and describe any two:
        1. nests
        2. burrows
        3. trails
    b. Locate and investigate any two:
        1. animal droppings
        2. animal tracks
        3. owl pellets
    c. Listen, locate and describe:
        1. animal song
        2. animal movement
    d. Follow an animal trail and find:
        1. food
        2. shelter
        3. water
    e. Develop three methods your students may use for animal study.
    f. Write a short story, diary form, entitled "A Day in the Life of a Deer Mouse."
    g. Explain why some people believe that there are more deer in the Pine Barrens now than when our forefathers settled here.

EVALUATION AND DISCUSSION:

1. Develop study questions concerning animal study that can be utilized in the classroom.

2. In order to prepare participants to carry out classroom lessons on animals, participants should discuss preparation, organization and procedures such as:

    a. objectives
    b. organization
    c. supervision
    d. lesson plans
    e. evaluation

BIBLIOGRAPHY:

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CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Art with Native Materials

OBJECTIVES:

1. Participant will be able to select and collect natural materials suitable for useful and creative children's projects.

2. Participant will demonstrate beginning skills in developing a project using original designs.

OUTLINE:

1. Discussion:

    a. Value of using native materials.
    b. Availability of native materials.
    c. Importance of conserving native materials.
       (Take only what you can use.)
    d. How to avoid adding litter to the woods.
    e. Project suggestions, descriptions, materials needed and procedures.
    f. Idea exchange.

2. Planning and procedure:

    a. Project planning by each participant.
    b. Collection of materials.
    c. Work on project (i.e. collages, centerpieces, mobiles, charcoal drawings, other.)
    d. Clean up area where project was developed.

3. Conclusion:

    a. Art display.
    b. Discussion of conservation practices using native materials.
    c. Evaluation - discussion.

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Art with Native Materials

POSSIBLE PROJECTS:

Clay
Rubbings
Collages
Puppets
Jewelry
Weaving
Cedar Craft
Dyes
Leaf Prints
Plaster Casts
Charcoal Drawing
Wood Carving
Mobiles
Centerpieces
Sand Sculpture
Snow Sculpture
Relief Maps
Boomerangs
Magnifying Glass Frames
Driftwood
Bulletin Boards

Gee Haw Whimmy Diddle Sticks (Soo Sticks)
Conservation Charts and Posters

Building Projects: Bird Houses, Bird Feeders, Traps, Nature Trail Signs, Weather Instruments, Biltmore Sticks, Ant Farm, Display Boxes, Nature Diorama, Bird Blinds, Wildlife Shelters

CONCLUSION:

Final discussion and evaluation

PARTIAL BIBLIOGRAPHY:

Bale, Robert O., Conservation for Camp and Classroom, Burgess Publishing Co., Minneapolis, Minn. c. 1962.

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CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Conservation Activities

OBJECTIVES:

1. Participants can verbally demonstrate an understanding of the need to teach a "Conservation Ethic."

2. Participants are able to recognize at least three conservation techniques or practices employed in the vicinity.

3. Participants are able to write out a lesson plan concerning conservation activities to be conducted while their class is in residence at CESC.

4. Participants are able to explain and conduct at least three conservation lessons on their school site.

OUTLINE:

1. Discuss reasons for introducing conservation activities into the curricula of American schools.

    a. Relate conservation needs as an individual concern.
    b. Relate conservation needs for society.

2. Conservation concerns:

    a. water
    b. soil
    c. mineral
    d. forest
    e. wildlife
    f. air pollution
    g. noise pollution
    h. thermal pollution

3. Lesson development:

    a. objectives
    b. generalizations
    c. correlation to other subject disciplines
    d. evaluations

Conservation Activities - cont'd

ACTIVITIES:

1. Display several indoor conservation projects or displays and explain their construction.

2. Read, discuss and select three conservation activites from the Forest Service bulletin on "Forestry Activities."

3. Distribute lesson plan format and sample lesson and explain techniques for writing objectives, generalizations, techniques and evaluations.

4. Using lesson plan format, have participants develop three "on site" conservation lesson plans.

5. Using lesson plan format, have participants develop one residency conservation plan.

CONCLUSION:

Final discussion and evaluation.

MATERIALS:

1. Published materials on conservation activities.

2. Format for developing an environmental lesson plan.

BIBLIOGRAPHY:

Pamphlets

1. Conservation Activities for Young People, Forest Service, U.S. Dept. of Agriculture.

2. Teaching Soil and Water Conservation, U.S. Dept. of Agriculture.

3. Litter Prevention....an Aid to Conservation, Keep America Beautiful, N.Y.

4. Forestry Activities, Forest Service, U.S. Dept. of Agriculture.

Texts

1. Bale, Robert O., Conservation for Camp and Classroom, Burgess, 1966.

2. Hug, John W., Curriculum Enrichment Outdoors, Harper & Row Pub., N. Y. 1965

3. Stapp, William B., Integrating Conservation and Outdoor Education into the Curriculum (K-12)

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

GEOLOGY

OBJECTIVES:

1. Participants should be able to recognize selected landforms and geological processes in miniature (uniformitarianism).

2. Participants should be able to project volume changes in eroded or deposited earth materials.

3. Participants should be able to give a verbal account of the geological history of the immediate area.

OUTLINE:

1. General geological history of the Mount Misery-Whitesbog area.

2. Characteristics of geological formation in Pine Barrens.

   Cohansey, Kirkwood
   Bridgeton
   Beacon Hill

3. Geological Processes

   Erosion and Transportation, Gully Erosion, Sheet Erosion,
   Pedestal Rocks, Sedimentation
   Texture vs. Velocity (slope)

   Stream Cutting (Erosion)
      Meanders
      Channels
      Rapids

   Stream Cutting (Deposition)
      Deltas and Alluvial Fans
      Flood Plains

   Weathering
      Rock and Pebble Polishing
      Weathering and Rotting of External Surfaces

   Watersheds

      Main Drainage Streams
      Tributaries
      Patterns

Geology - cont'd

PROCEDURES:

1. Discuss items listed in outline.

2. Visit a gravel pit or large area with freshly uncovered earth materials and do the following:

   a. Locate and demonstrate:

      (1) Gully erosion
      (2) Sheet erosion
      (3) Pebble and pedestals

   b. Locate and demonstrate:

      (1) Stream rapids
      (2) Undercutting
      (3) Flood plains
      (4) Alluvial fans
      (5) Meanders

   c. Locate and demonstrate:

      (1) Rock or pebble weathering
      (2) Frost cracking
      (3) Pebble polishing
      (4) Chemical cementation or concretion

   d. Trace a watershed in gullies of a gravel pit and find:

      (1) Chief drainage stream
      (2) Tributary streams
      (3) Dendritic drainage patterns

   e. Work out these projections and problems:

      (1) Locate a sheet erosion area. Determine average or model depth of erosion of the "sheet." Determine the volume of transported earth with materials on an area 10 feet square. Determine the approximate volume of eroded material in the entire vicinity of the sheet erosion sample.
      (2) Compute the amount of eroded or deposited material found in the gravel pit--in cubic feet--in tons.
      (3) Sketch a drainage pattern found in the gravel pit.
      (4) Sketch a drainage pattern found on less sloping land, e.g., north beach of Mt. Misery Lake.

EVALUATION AND DISCUSSION:

1. Elicit response from participants concerning their reactions to the preceding lesson(s).

2. Encourage participants to share and exchange knowledges of reference and resource material related to this topic.

3. Develop study questions concerning geology that can be utilized in the classroom.

4. In order to prepare participants to carry out classroom lessons on this topic, have participants discuss preparation, organization and procedures, such as:

   a. objectives
   b. organization
   c. supervision
   d. lesson plans
   e. evaluation

5. Estimate or determine which of the stated behavioral objectives can now be demonstrated by the members of the group.

MATERIALS AND EQUIPMENT:

Tape Measures	(2)
Shovels	(2)
Soil Auger	(2)

PARTIAL BIBLIOGRAPHY:

Gilluly, Waters and Woodford, Principles of Geology, W.H. Freeman, 1965

N. J. Dept. of Geology and Topographic Survey, Atlas Map H 50, The Geology of New Jersey.

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CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Exploring an Historic Site

OBJECTIVES:

1. Participants will learn techniques to use for studying an historic site.

2. To stimulate interest in using an historic site by encouraging participants to actively investigate such an area. (The Mt. Misery Hotel site was used in this model.)

3. Participants will demonstrate familiarity with the history of this site.

4. Participants develop plans using this method of study with their class(es).

OUTLINE:

1. Historic Background of the Site

2. Discussion of Methods Employed for Site Study

   a. Examination of building materials which may be found at the site:

      (1) iron
      (2) wood
      (3) brick and stone
      (4) glass

   b. Mapping the site will integrate mathematics with history and provide a record for future study.

      (1) Using a compass to orient buildings and preparing sketch map.
      (2) Measuring and scaling the dimensions of the site.
      (3) Use of transit in preparing map of the site.

3. Study of Buildings or Ruins

   a. Dating the building or foundation
   b. Sketching and/or photographing site
   c. Locating and identifying domestic plants
   d. Locating original water supply
   e. Following fence lines, foot paths, drives

4. Artifact Hunt and Study

   a. How were the artifacts used?
   b. How old are the artifacts?
   c. Where were the artifacts found?

PROCEDURES:

Note: Whenever possible, artifacts should be returned to the same location where they were found. Thus, artifacts will remain for future groups to use.

1. Divide the participants into small groups and have each group carry out one of the following tasks:

Group 1

Dig at historic site for artifacts. Sift soil through a wooden frame with 1/4" hardware cloth tacked to the bottom. Attempt to locate at least three artifacts. Describe and sketch artifacts. Attempt to determine the purpose for which they were used. Replace artifacts where they were found. Give mapping group locations of artifact finds for their map.

Group 2

Using a plane table, transit and sighting poles, map the historic site. Include on the map buildings, foundations, trash piles, gardens, fence lines, roads, domestic trees and locations of artifacts.

Group 3

Record the height, width and length of the buildings or foundations. Decide what building materials were used. When examining a foundation, estimate the date the building was destroyed. What is the age of the woody plants growing inside the foundation? Determine what purpose the building served.

Group 4

Look for domestic plants growing next to the building, in the garden and along the walkways. Can you find herbs and flowers growing? Identify as many domestic plants as possible. What do the plants that have escaped from cultivation, indicate about the people that lived at the site?

2. Discuss or attempt to answer the following groups of questions:

   a. Determine the complete dimensions of the site. Is it possible to determine how many people lived or worked there? What was the source of income for the people who lived there? Why doesn't anyone live there now?

   b. How many buildings were there? What were the buildings used for? How were the buildings destroyed?

EVALUATION AND DISCUSSION:

1. Elicit response from participants concerning their reactions to the preceding lessons.

2. Develop study questions concerning Exploring An Historic Site that can be utilized in the classroom.

3. In order to prepare participants to carry out classroom lessons on this topic, have participants discuss preparation, organization and procedures, such as:

   a. objectives
   b. organization
   c. supervision
   d. lesson plans
   e. evaluation

4. Estimate or determine which of the stated behavioral objectives can now be demonstrated by the members of the group.

MATERIALS NEEDED:

1. soil sieve, wooden frame with 1/4" wire screening tacked to bottom
2. hand shovels
3. compass
4. plane table - made in school
5. transit - made in school
6. sighting poles - made in school
7. rulers
8. 50' measuring tape
9. paper and pencils
10. reference books on: a. garden plants
    b. antique pottery and glass
11. increment borer (optional)

BIBLIOGRAPHY:

Beck, Henry Charlton, Forgotten Towns of Southern New Jersey, Rutgers University Press, New Brunswick, New Jersey, 1961

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Beck, Henry Charlton, The Roads of Home, Rutgers University Press, New Brunswick, New Jersey, 1956

Stockton, Frank R., Stories of New Jersey, Rutgers University Press, New Brunswick, New Jersey, 1961

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Language Learnings Beyond the Classroom Door

OBJECTIVES:

1. Participants are able to demonstrate familiarity with a variety of language arts activities in the out-of-doors.

2. Participants are able to use the outdoors as a motivational device for language arts development.

3. Participants are able to place themselves in a subjective relationship to the outdoors in order to enhance creativity.

OUTLINE:

1. Reading Readiness

    a. Discrimination among structures of natural objects as a word choice skill builder

    b. Vocabulary development through a wide variety of experiences

2. Spelling Skills

    a. Word skills gained from direct experiences

    b. Sand used as chalkboard

3. Reference Skills

    a. Organizing and classifying sensory impressions
    b. Notetaking on the trail
    c. Indoor research after an outdoor experience
    d. Diary keeping (ability to summarize impressions obtained)

4. Oral Presentation

    a. Acting out verbs
    b. Dramatizing outdoor events
    c. Giving group reports

5. Creative Writing

    a. Imaginary interviews
    b. Haiku poetry
    c. Legends and myths
    d. Stories, poetry and essays based on outdoor experiences

PROCEDURE:

An information-gathering hike during which each participant will choose one or more of the following activities:

1. Prepare a list of sense impressions obtained on an outdoor hike, classified according to the sense most often used.

2. Prepare a news report on storm or fire damage from the viewpoint of an ant, an earthworm, a squirrel or other small animal.

3. Pretend you are a scientist from another planet. Describe an object (tree, shrub, flower) so that another scientist from your planet could identify the object. You may not use words commonly associated with such objects as: trunk, leaf, stem, root, bark, etc. Descriptions must be in universally identifiable terms.

4. Dramatize an outdoor event--activities of animals; trees or plants in the wind; happenings on trail. (The outdoors is an excellent place to act out verbs.)

5. Prepare a report on the outdoor hike for presentation to a group which did not go on such an activity.

6. Write a paragraph describing an area which you saw on your hike. In this paragraph, pay particular attention to communicating sensory images gained on your hike.

7. Write a poem, short essay, etc. based on outdoor experiences.

8. Using selected books, put together poems, bits of prose, that capture in word pictures the emotions, sights, sound, smells of the outdoor experience.

EVALUATION AND DISCUSSION:

1. Elicit response from participants concerning their reactions to the preceding lesson.

2. In order to effect utilization of the learnings involved in this lesson, have participants discuss preparation, organization and presentation of classroom lessons on this topic. Areas which should be emphasized are:

   a. objectives
   b. organization
   c. supervision
   d. lesson plans
   e. evaluation

Language Learnings Beyond the Classroom Door - cont'd

3. Determine which of the stated behavioral objectives for the lesson can now be demonstrated by the members of the group.

MATERIALS NEEDED:

Paper, pencils, glue, scissors, etc., as needed for various activity projects.

BIBLIOGRAPHY:

Bale, Robert O., Conservation for Camp and Classroom, Burgess, Minneapolis, Minn., 1966

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Sandburg, Carl - any volume of their poems

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CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Mathematics in the Out-of-Doors

OBJECTIVES:

1. Participants should be able to apply selected mathematics concepts to practical methods of demonstration in the outdoor environment.

2. Participants should be able to solve selected practical mathematics problems presented to them or developed by them.

3. Participants should be able to plan an outdoor mathematics lesson for their class(es).

OUTLINE:

1. Discussion:

   a. Which math lessons might take place outdoors?

   b. Selected math topics which might be taught out-of-doors:

      1. angles
      2. map reading
      3. area
      4. ratio
      5. perimeter
      6. latitude and longitude
      7. standard units of measure
      8. graphing
      9. percentages
      10. geometric figures:
          a. perpendiculars
          b. parallels
          c. circles
          d. triangles (congruent, similar)
          e. other figures

   c. Demonstration - Measurement of an inaccessible area.

   d. Participants activity sessions

2. Procedures:

   a. Discussion as outlined
   b. Demonstration outdoors
   c. Participants' training session outdoors:
      1. Participants divide into small groups and each group undertakes one of the tasks below:
         (a) demonstrate a method of teaching perimeter and area in the outdoors
         (b) demonstrate a method of teaching map reading in an outdoor setting

(c) devise a measurement problem to be solved in the out-of-doors
(d) give four demonstrations that show why standardized units of measure replaced units of measure based on human body parts

2. Small groups attempt the tasks projected below:
(a) How tall is the dead tree east of the Mt. Misery road, bordering the athletic field? Why is the tree dead? How old was the tree when it died?
(b) Use two methods to measure the distance from the front door of Larch Lodge to the Mt. Misery Brook Bridge.
(c) Describe in detail the walking path you would follow to reach the Mt. Misery Lake. How far do you walk? How long does it take?
(d) Locate a topographical map of Mt. Misery. What is the distance from Mt. Misery to MacDonalds--to the sand pit and return to Mt. Misery. Use roads, take the shortest route.

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CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Let's Look and See Beyond Yonder Tree!

Outdoor Observation Experiences

OBJECTIVES:

1. Participant should be able to demonstrate increased ability in the utilization of one or more of his senses.

2. Participants should be able to demonstrate ability to sort objects into categories by identifying observable characteristics.

3. Participants should be able to list some observation techniques applicable to various grade and ability levels.

OUTLINE:

1. Importance of Observation Skills

    a. To all curricular areas:

        1. development of reading readiness
        2. ability to select meaningful items from raw data

    b. In general living and the development of aesthetic sensibilities:

        1. both safety and appreciation require knowledge of the environment and its contents
        2. knowledge requires observation

2. Using Our Senses

    a. Which of our senses do we employ most often in the out-of-doors?
    b. Do sensory experiences occur in isolation or are experiences usually multi-sensory?
    c. Why do we fail to see the "obvious"?

        1. inability to narrow our vision so as to study small areas intensively,
        2. lack of experience in discriminating among sensory data.

    d. How can we develop a "filtering process" in selecting, recording and responding to sensory stimuli?

        1. direct experience lessons in dealing with tangible aspects of the environment
        2. use of the various techniques of the artist in recording outdoor impressions, e.g., sketching, collage, sculpture, photography

Outdoor Observation Experiences - cont'd

3. Observation as a Classroom Tool

   a. What observation lessons (outdoors or indoors) would be useful with each participant's class?

   b. What further experiences could be planned to build on the skills acquired in the above lesson?

EVALUATION AND DISCUSSION:

1. Discuss reactions of participants to preceding lesson.

2. Encourage particpants to share knowledge of reference and resource material pertinent to this topic.

3. Develop activity problems for the classroom to be solved by using observation skills.

4. Have participants discuss classroom lessons on this topic in order to assure confidence, coherence and communication in said lessons:

   a. objectives
   b. organization
   c. supervision
   d. lesson plans
   e. evaluation

5. Determine which of the stated behavioral objectives have been met by participants.

MATERIALS NEEDED:

1. worksheets and pencils

2. paper bags

BIBLIOGRAPHY:

Hug and Wilson, Curriculum Enrichment Outdoors, Harper & Row, Evanston, Ill., 1965

Bale, Robert O., Conservation for Camp and Classroom, Burgess, Minneapolis, Minn., 1962

Stapp, William B., Integrating Conservation and Outdoor Education into the Curriculum, Burgess, 1965

Science Curriculum Improvement Study, Material Objects - A Teacher's Guide, D. C. Heath and Co., Berkeley Calif., 1966

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

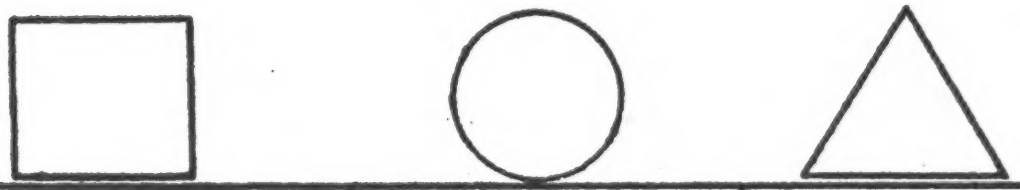
Outdoor Observation Experiences

OBSERVATION SKILLS - WORK SHEET

Instruction -- Participants will be in teams of two for an activity hike. Each team will have two goals:

1. Collect objects which can be grouped according to some observable property (e.g. all one color, all round, all soft, etc.), or collect objects which appeal to you. Be prepared to sort your collection into categories at our summary session.

2. Find as many simple geometric forms as possible in nature. List them under the appropriate heading below. Sketch if necessary.



Combinations

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Pine Barrens Ecology

OBJECTIVES:

Participants should be able to:

1. identify the dominant trees of the Mt. Misery area.
2. identify some of the common shrubs and herbs of this area.
3. identify some animal signs of the Mt. Misery area.
4. contrast selected upland and lowland environments of the Pine Barrens.
5. develop a chart identifying producers, consumers, and decomposers in the Mt. Misery area.
6. identify the results of isolated or reoccuring forest fires in this area.
7. correlate classroom studies with one or more ecological studies.

OUTLINE:

A. Introduction to Pine Barrens

   1. Upland area
   2. Lowland area
   3. Bog area

B. Define and identify these organisms

   1. Producers
   2. Consumers
   3. Decomposers

C. Transect of this area

   1. Use the topographic map to obtain a compass bearing for transect. (Make certain that the bearing takes in highland and lowland areas.)
   2. Stations for investigation and collection will be set up every 100 ft. along bearing.

Pine Barrens Ecology (cont'd)

PROCEDURES:

A. Collect following data at each station.

1. Identify and estimate numbers of plants and animals. (Collect samples.)
2. Take soil and air temperatures.
3. Test the soil acidity.
4. Obtain soil samples for studies.
5. What signs of fire are visible?

B. Return indoors to complete data, for further study of samples, and to discuss findings on fires in the Pine Barrens.

EVALUATION AND DISCUSSION:

1. Elicit responses from participants concerning their reactions to the preceding lesson(s).

2. In order to prepare participants to carry out classroom lessons on this topic, have participants discuss preparation, organization and procedures, such as

a. objectives
b. organization
c. supervision
d. Lesson plans
e. evaluation

MATERIALS NEEDED:

air thermometer
compasses
hand lens
plastic bags
pocket reference books
soil thermometer
soil pH test kits
topographic maps
vasculum

BIBLIOGRAPHY:

A Field Guide to the Birds, Peterson, 1949

Keys to Woody Plants, Comstock Publishing Associates, 1950

Manual of the Trees of North America, Dover Publications, Inc., 1965

Principles of Field Biology and Ecology, McGraw-Hill, 1958

Wild Flower Guide, Doubleday Nature Guides, 1948

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
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Pinelands Soils

OBJECTIVES:

Participants should be able to:

1. recognize selected soil types that are found in the Pines.
2. differentiate between the A, B, and C soil horizons.
3. distinguish the soils from different ecological locations in the Pines, (upland, lowland, bog and gravel pit).
4. correlate classroom studies with the environment.

OUTLINE:

A. Soils (Obtain samples that illustrate specifics studies.)

1. Composition

    a. organic
    b. inorganic

2. Origins

    a. sedimentary
    b. igneous
    c. metamorphic

3. Soil Acidity (pH measurement)

    a. acid
    b. alkaline

4. Formation

    a. weathering
        (1) chemical
        (2) mechanical

5. Deposition

    a. water
    b. wind

6. Soil Horizons

    a. A
    b. B
    c. C

Pinelands Soils - cont'd

PROCEDURES:

Investigate soil horizons in the following areas:

1. Upland area of pine and oak

    a. Draw a soil profile.
    b. Take a sample of each soil type for further study,
        (1) Test for pH measurement
        (2) Use a hand lens to check particle size and shape.
    c. Note what effect water has had in this immediate area.

2. Lowland area of cedar and maple

    a. Draw a soil profile.
    b. Take a sample of each soil type for further study.
        (1) Test for pH measurement
        (2) Use a hand lens to check particle size and shape.
    c. Note what effect water has had in this immediate area.

3. Bog area of heaths and moss

    a. Draw a soil profile.
    b. Take a sample of each soil type for further study.
        (1) Test for pH measurement
        (2) Use a hand lens to check particle size and shape.
    c. Note what effect water has had in this immediate area.

4. Gravel pit area

    a. Draw a soil profile.
    b. Take a sample of each soil type for further study.
        (1) Test for pH measurement
        (2) Use a hand lens to check particle size and shape.
    c. Note what effect water has had in this immediate area.

5. Return to indoor study area to examine and test collected samples.

EVALUATION AND DISCUSSION:

1. Elicit responses from participants concerning their reactions to the preceding lesson(s).

2. Develop study questions concerning Pinelands Soils that can be utilized in the classroom.

3. In order to prepare participants to carry out classroom lessons on this topic, have participants discuss preparation, organization and procedures, such as:

   a. objectives
   b. organization
   c. supervision
   d. lesson plans
   e. evaluation

MATERIALS NEEDED:

- shovels
- plastic bags
- soil augers
- soil tubes
- soil pH test kits
- hand lens
- tape

BIBLIOGRAPHY:

Field Book of Nature Activities and Conservation, G.P. Putnam's Sons, 1961

New Jersey Soils, College of Agriculture, Rutgers, New Brunswick, N.J. Circular 601

Soil Survey of the Chatsworth Area, N.J., Government Printing Office, 1923

Teaching Soil and Water Conservation, U.S. Department of Agriculture, 1965

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Public Lands - Development and Protection

OBJECTIVES:

1. Participants can verbally demonstrate an awareness of the need to acquire, develop and protect public lands.

2. Participants are able to locate and acquire materials on municipal, county, state and federal public lands.

3. Participants are able to make contacts with local and state authorities as resource personnel in their classroom.

4. Participants are able to develop unit studies, using conservation as the core of the units, which draw upon all the other subject disciplines.

OUTLINE:

1. The need for public lands

    a. urban sprawl
    b. megalopolis
    c. watersheds
    d. recreation
    e. wildlife preserves
    f. historical restoration

2. Acquisition, development and protection of public lands

    a. Green Acres Program (Whitesbog)
    b. Wharton Tract
    c. Pine Barrens exploitation
    d. Services - State, County and City Parks
    e. Historical development
    f. Forest Fire Service

3. Lebanon State Forest

    a. forest fire service
    b. recreational facilities
    c. historical development
    d. agricultural studies
    e. wildlife protection

Public Lands - Development and Protection (cont'd)

ACTIVITIES:

1. Discuss the need to acquire, develop and protect public lands.

2. Review the brochure "The Green Acres Program" and the pamphlet "Exploitation of the New Jersey Pine Barrens." Discuss present state programs to acquire public lands.

3. Select conservation themes and discuss ways to include other subject disciplines in teaching these themes.

4. Field trip to Lebanon State Forest with Mr. George Michner, the park superintendent. Observe methods of development and protection employed in this state park.

5. Distribute lists of resource personnel and sources of material on public lands.

6. Forest fire protection

   a. Visit to fire tower
   b. Study of burned over area.

MATERIALS NEEDED:

1. List of resource personnel
2. Source list of classroom materials and references
3. Pamphlets: "Exploitation of the New Jersey Pine Barrens"
4. "Green Acres Program" brochure
5. CESC bus
6. Map of U.S. East Coast

EVALUATION AND DISCUSSION:

1. Elicit response from participants concerning their reactions to the preceding lesson.

2. In order to effect utilization of the learnings involved in this lesson, have participants discuss preparation, organization and presentation of classroom lessons on this topic. Areas which should be emphasized are:

   a. objectives
   b. organization
   c. supervision
   d. lesson plans
   e. evaluation

BIBLIOGRAPHY:

Edwards and Kelcey, New Jersey Open Space Recreation Plan, New Jersey Department of Conservation and Economic Development, Trenton, N.J., 1967

Humble Oil Co., Map of the United States' East Coast

Patterson, Frank G., Exploitation of the New Jersey Pine Barrens, Past, Present and Future, (pamphlet) CESC Press, Whitesbog, N.J., 1967

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
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Recreation in the Out-of-Doors

OBJECTIVES:

1. Participants will be able to list some objectives for recreation in the out-of-doors.

2. Participants will be able to plan and execute both active and passive recreational activities conducive to the outdoor environment.

3. Participants will be able to use available resources to initiate and execute outdoor recreation in the classroom, on the school site, and with a residency program.

OUTLINE:

1. Discussion:

    a. What is recreation in the out-of-doors?

    b. Values of recreational activities.

    c. Discussion of activities conducive to an outdoor setting. (i.e. activities not normally conducted in the classroom)

    d. Discussion of classroom, on-site, and community activities that can be related to outdoor recreation.

    e. Importance and/or meaningful use for outdoor recreation.

    f. How to adapt an activity to the outdoor setting.

    g. Continuity of some outdoor recreation activities.

2. Planning and Participation:

    a. In small groups or as individuals select, research and teach one of the activities, listed on the attached sheet, to the rest of the group.

    b. Prepare a lesson or originate an activity to use with a class in an outdoor setting.

    c. Describe and discuss the activity with the group.

    d. Teach several songs to group and discuss value of group singing as a recreational activity.

Recreation in the Out-of-Doors - cont'd

CONCLUSION:

Final discussion and evaluation.

List of Recreational Activities in the Out-of-Doors

Keeping and observing small animals, aquariums or terrariums
Collecting, identifying and mounting insects
Rock and mineral collections
Nature exploration trails -- interpretive with magnifying glass
Cleaning and maintaining a woodlot, stream, pond, etc.
Identification in the out-of-doors by touch, smell and sound
Treasure or scavenger hunt in out-of-doors
Campfire activities, such as group singing, skits, pantomime, charades and games
Square and folk dances
Athletics, stunts, relays; winter sports
Fishing
Art with native materials, coupled with an art exhibit
Creative writing
Map and compass hikes
Indian games
Outdoor cooking
Photography

MATERIALS:

Quantity and type of materials will vary with activity selected.

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American Camping Association, Sing, Cooperative Recreation Services, Inc., Delaware, Ohio.

Bale, Robert O., Conservation for Camp and Classroom, Burgess Publishing Company, Minneapolis, Minn., c 1962

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Children's Bureau, Handbook for Recreation, U.S. Department of Health, Education and Welfare, c. 1950

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Lalchaw, Marjorie, A Pocket Guide of Games and Rhythms, Prentice-Hall, Inc., Englewood Cliffs, N.J., c. 1956.

Phillips, W.S., Indian Campfire Tales, Platt and Munk, New York, c. 1955

Vinal, William ("Cap'n Bill") Gould, Nature Recreation, Dover Publications, Inc., New York, c. 1963

Zim, Herbert S. and Burnett, Will R., Photography, Golden Press, New York, c. 1956

CONSERVATION AND ENVIRONMENTAL SCIENCE CENTER
FOR SOUTHERN NEW JERSEY

Teachers' Study Guide for The Pine Barrens

1. How can you tell when you are in the "Pine Barrens" area of New Jersey? What are the different areas to be found within the Pine Barrens?

2. After visiting and studying in the Pine Barrens, can you identify: dry land trees, wet land trees, and flowering plants that grow in this unique ecological area of New Jersey?

3. What special plants and animals are found in the Pine Barrens and nowhere else?

4. Do forest fires ever occur in the Pine Barrens? If so, what evidence of fire damage can be found?

5. How could you tell when a fire last occurred in a Pine Barrens area?

6. How can we protect the Pine Barrens from fire? Is this protection good or necessary?

7. What evidence can you find to prove that the Pine Barrens area is one of New Jersey's greatest water resources?

8. Describe another natural resource role the Pine Barrens area serves for the state of New Jersey?

9. After visiting the Pine Barrens list some suggestions why the area has been under-developed for more than 200 years?

10. How many people live in the Pine Barrens today?

11. What kind of work do most of these people do?

12. Describe how some of the early Pine Barrens settlers lived and what they did for recreation?

13. Offer an explanation as to why the early settlers moved away from the Pine Barrens.

14. What is the legend of the Jersey Devil? What is your favorite Pine Barrens legend? Before visiting the Pine Barrens were you familiar with the lore of the region, its ghost towns, and former industries?

15. Do you think the Pine Barrens should become a National Monument? In your opinion, does the Pine Barrens area meet the requirements for establishing it as a national monument?